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and Vicksburg is accounted for by the low stage of the tributaries at these stations, which allowed the flood to spread by running up the comparatively empty river beds. In other cases the departure from parallelism may be explained by the suddenness of the rise and fall and by the contraction or expansion of the river bed by the removal or replacement of dikes and levees. During March and April, a secondary rise of the river occurred which excelled the January rise in some portions of the Ohio River, but which fell four feet short of the first rise at Cairo.

WORCESTER, MASSACHUSETTS.

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KASSNER'S METEOROLOGICAL GLOBES.\*

BY

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I wish to call the attention of my colleagues of the Association of American Geographers to a new and, as it seems to me, valuable addition to the teaching equipment now provided in meteorology and climatology. Every teacher of these branches of science, and of physical geography in the large, has had frequent occasion to regret that the great facts of temperature, pressure and prevailing winds have to be learned from charts which, especially if these are on the Mercator projection, as is often the case, are very apt to give the student a distorted or unreal picture of the actual meteorological conditions, as well as of the relative sizes of the zones. Professor Kassner, who is one of the officials of the Royal Prussian Meteorological Institute in Berlin, and *Privatdocent* at the *Technische Hochschule* there, has recently constructed two "meteorological globes" which can be most highly recommended for use wherever meteorology and climatology are taught. These globes, which measure 34 centimetres (nearly 13½ inches) in diameter, show the temperature, pressure and prevailing winds for January and July on the basis of the latest and most complete data available up to the spring of 1907. The globes are well mounted, at the proper inclination, on a wooden base. A simple and very useful device makes it possible to turn

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\* Read by title before the meeting of the Association of American Geographers, held at Chicago, Ill., December, 1907.

the globes over, so that the south polar region is at the top, thus obviating the inconvenience which is encountered, in the use of the ordinary rigidly set globe, when one wishes to study the southern hemisphere, and especially the higher latitudes of the southern hemisphere. The price of the globes is 50 marks, and 3 marks additional is charged for packing. They may be purchased of Dietrich Reimer (Ernst Vohsen), Berlin.

Kassner's globes will unquestionably facilitate and simplify any instruction in which there is need of presenting the broad facts which they so clearly set forth. The seasonal changes and migrations can easily be seen by a comparison of the January and July conditions.

The distribution of pressure is shown by means of isobars in blue, drawn from 2 mm. intervals. The isobar of 760 mms. (29.92 inches) is heavier than the others. The pressures above 760 mms. are shown in solid isobars and those below 760 mms. in broken isobars. The great dominant areas of high and low pressure (the so-called "centres of action of the atmosphere") stand out very clearly, and it is easy to see why so much importance is now attached to these areas as controls of weather and climate.

Temperatures are shown by red isotherms. The critical isotherm of  $0^{\circ}\text{C}$ . ( $32^{\circ}$  Fahr.) is especially emphasized, as are the isotherms for every even  $10^{\circ}\text{C}$ . Isotherms are drawn for every  $4^{\circ}\text{C}$ ., and in places for every  $2^{\circ}\text{C}$ . Further, in order that the distribution of temperature may be more clearly seen, all parts of the globe over  $0^{\circ}\text{C}$ . are colored red, and all parts below  $0^{\circ}\text{C}$ . are colored blue, in the conventional way, different shades of red and blue indicating different grades of heat and cold. The darker shades show the greater extremes.

The prevailing winds are indicated by arrows, flying with the wind. The lands are shaded in grey, the higher elevations being emphasized by darker shading. Another useful point about these globes is the indication, by different symbols, of the location of the central stations of all meteorological services; of observatories, and of the more important meteorological stations the world over.

I desire, also, particularly to call the attention of my colleagues to Professor Kassner's *Anleitung zum Gebrauch der Kassner'schen Meteorologischen Globen, und zu Demonstrationen über die Raumverhältnisse der Atmosphäre*, a pamphlet of 6 pages. In this, under various headings, the actual values, and the relative values with reference to the size of the globes, are given for certain of the more important data concerning (1) the essential astronomical facts; (2)

the earth's rotation; (3) the height of the atmosphere; (4) the size and progression of low pressure areas; (5) cloud heights; (6) high balloon and kite ascents; (7) the altitudes of observatories; (8) the deepest boring for earth temperatures; and (9) the area embraced in the regular weather maps of the Deutsche Seewarte. This summary is not only useful in itself, but it adds greatly to the value of the globes for purposes of instruction. At the end several diagrams are given, which, in order to bring out the relative dimensions and areas with reference to the globes, are intended to be pasted onto papers of the proper thicknesses, and then to be applied to the globes. These diagrams represent (1) the height of cirrus clouds; (2) the average area covered by a typhoon; (3) the average area covered by an ordinary cyclone; (4) the area covered by the German weather maps; (5) the height of the atmosphere, and (6) the circle of visibility of luminous clouds.

It is to be hoped that Professor Kassner's excellent work on these globes will receive proper recognition in the United States, and that the globes will find a place in the equipment of many geographical and meteorological laboratories.

## NIUĒ: A RECONNAISSANCE.

BY

WILLIAM CHURCHILL.

NIUĒ-FEKAI, traditional names Nuku-tu-taha, Motu-te-fua, Fakahoa-motu, Nukutuluea. Latitude (south point, Halafualagi),  $19^{\circ} 10' S$ , longitude,  $169^{\circ} 17' W$ ; length (N-S), ca. 17 miles; width (E-W), ca. 11 miles; perimeter, ca. 40 miles; average elevation, 220 feet. Population: Polynesian; mission census 1899, 4,576, distributed as follows in village communities—Alofi, 719 and 49 students at the mission school; Tamakautoga, 275; Avatele, 401; Fatiau, 104; Hakupu, 456; Liku, 383; Lakepa (or Tamalagau), 234; Mutualau, 524; Hikutavake and Tamahatokula, 248; Tuapa (or Uhomotu), 426; Makefu, 196; absent on foreign islands, 561. British Residency, Alofi; head station of the London Missionary Society, Alofi; residence of the Patu-iki (king) Togia-Pulu-toaki (anointed June 30, 1898), Tuapa. First set upon the charts by Captain Cook in his second voyage, sighted June 20, 1774, landed June 21 at Opahi, named Savage Island. First mission visit, John Williams in the *Messenger of Peace*, July, 1830, at Falekula; first resident European missionary, Rev. W. G. Lawes, 1861, at which time the whole island, save 8 persisting heathen, had been converted by Samoan teachers. Annexed to Great Britain, April 20 and October 19, 1900; annexation transferred to New Zealand, June 11, 1901.